NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE SPECIFICATION

754 - ANIONIC POLYACRYLAMIDE CANAL AND DITCH TREATMENT

1. SCOPE

This contractor shall provide all the materials, equipment and labor necessary to apply anionic polyacrylamide (PAM) soil flocculent to irrigation field ditches, irrigation canals or laterals at the rates and locations described in this specification or in the attached job sheet(s).

2. MATERIALS & EQUIPMENT

The polyacrylamide used under this specification shall be formulated as dry granular beads or powder, and must satisfy the following requirements:

1. The PAM must be approved by the manufacturer for the intended use;
2. The PAM must be of the anionic type, include a minimum of 80% active ingredient, by weight, and contain no more than 0.05 percent acrylamide monomer, by weight;
3. The PAM must have a charge density of 10 to 55%, by weight;
4. The PAM must have a molecular weight between 12 to 24 Mg/mole; and
5. The PAM must be designated as “water soluble”, “linear”, or “non-crosslinked.”
6. The product container label shall state the date of manufacture, and as manufactured values for items described in (2) through (5) above, or otherwise shall contain a certification statement from the manufacturer that the formulation satisfies the material requirements of Wyoming NRCS Interim Practice Standard 754, ANIONIC POLYACRYLAMIDE CANAL AND DITCH TREATMENT.

Prior to application the PAM shall be stored and handled in accordance with the manufacturer’s recommendations and all applicable laws, rules and regulations. PAM should be stored in a cool dry place away from direct sources of sunlight. PAM older than one year from the date of manufacture shall not be used.

Water used for preparing aqueous solutions must be sufficiently clean to avoid creating flocs in the mixing tank.

Equipment used for application of dry PAM shall be capable of broadcasting the material at a uniform rate over the area to be treated.

Equipment used for application of PAM as an aqueous solution shall be capable of sufficient mixing and aggitating to maintain the PAM in solution without jellying. To avoid shearing PAM molecules the PAM solution shall not be recirculated through the pump while agitating. Agitation should be accomplished by some form of mechanical mixing that stirs the solution. The equipment must be capable of spraying the solution uniformly over the surface area to be treated. The pump and nozzles shall be of the type required to minimize plugging and shearing of the PAM molecules.

3. SITE PREPARATION

To the extent feasible, all vegetation, algae, and other material below the normal waterline of the channel to be treated that could intercept or interfere with the uniform application of PAM shall be removed.

Outlets in the treated reaches of flowing channels shall be closed to prevent the discharge of PAM to unintended locations.

Pumps, headgates, and other structures in the canal shall be removed or covered when necessary to protect them from being coated with the PAM solution.

4. TIMING

Treatment of flowing channels may occur at any time the channel and water conditions are appropriate for application. Because treatment effectiveness decreases as water temperature decreases, when applying PAM to high elevation canals during abnormally cool periods, or early in the spring, PAM applications may need to be limited to the afternoon hours when water temperature is warmest for the most effective treatment.

Treatment of non flowing channels must be completed no sooner than seven (7) days before water is turned into the channel and no later than one (1) day before water is turned into the channel.

5. APPLICATION RATE

The initial treatment operation shall result in a uniform application over the entire surface to be treated at the rate shown in Section 8 of this specification, or on the attached Job Sheet(s). A canal-acre is defined as the channel's wetted perimeter, in feet, multiplied by the length of the channel to be treated, in feet, divided by 43,560 ft^2/acre. Subsequent treatments may be applied if necessary to achieve or maintain the desired amount of seepage reduction, except that the cumulative maximum annual application rate shall not exceed 40 pounds of active ingredient per canal-acre.

The applicator shall provide the owner calculations documenting the pounds of dry chemical or gallons of liquid solution to be applied per canal-acre that will result in achieving the specified target application rate of active ingredient.

6. APPLICATION METHODS

Treatment operations must be conducted in accordance with all applicable federal, state, and local laws, rules, and regulations.

For non flowing channels the area where PAM is to be applied consists of the channel perimeter below the normal waterline.

When PAM is used to treat flowing channels, it shall be applied over the full width of the water surface. Application to flowing channels should proceed in an upstream direction to prevent formation of clumps or globs of gel (fish eyes) on the surface.

Method A. Dry granular PAM shall be broadcast uniformly over the treatment area by a mechanical spreader. The spreader shall have been calibrated to determine the application rate. The application rate shall be checked by dividing the pounds of PAM applied by the area treated per each 1,000 foot interval over the entire length of channel.

Method B. An aqueous solution consisting of PAM and water shall be sprayed uniformly over the treatment area. Mixing of the solution must be performed immediately before its intended use. When mixing the solution, always add PAM to water, never add water to PAM in the mixing container. Add PAM to the water slowly, and maintain gentle agitation, as necessary, to minimize the formation of globs of gel. The equipment must be designed and operated to prevent plugging and to minimize shearing of the PAM molecules during application. The application equipment shall have been calibrated prior to its use. The application rate shall be checked by dividing the gallons of PAM applied by the area treated, for each full tank of solution applied.

Other chemicals may be included in the solution when labeled for such use and their presence will not reduce the effectiveness of the PAM.

PAM shall not be applied to channels within ½ mile of an open outlet or waste way where the treated water may be discharged to a flowing river, stream, creek, or a wetland. PAM shall not be applied over the last 100 feet of channel at the downstream end of the treatment reach to minimize the opportunity for transporting polymer beyond the treatment area.

PAM may be applied as far as 300 feet above the upstream end of the treatment reach to assure adequate polymer concentration within the entire treatment reach.

7. SAFETY REQUIREMENTS

PAM must be stored, handled and applied in accordance with all Occupational Safety and Health Administration (OSHA) Material Safety Data Sheet requirements and any additional recommendations from the manufacturer for the specified use. These include, but may not be limited to:

- Use of proper personal protective equipment, e.g. gloves, masks, and other health and safety precautions as required;
- Avoiding inhalation of large quantities of PAM dust, which can cause choking and difficulty in breathing. Persons handling and mixing PAM shall use a dust mask of a type recommended by the manufacturer.
- PAM solutions can cause surfaces, tools, etc. to become very slippery when dry residues are wetted. Therefore clean liquid PAM spills with dry absorbent material (sawdust, soil, cat litter, etc.) and sweep/collect dry PAM material without the use of water.
- Do not apply PAM when conditions are present that could result in the PAM being transported to unintended locations, such as during periods of high winds or during times when the channel is flooding out of bank. Use appropriate precautions to prevent drift over fruits, vegetables and other plants that may be consumed by humans.

8. SITE SPECIFIC PROJECT DETAILS

Fill in the design information and attach Wyoming NRCS Job Sheet No. 754 for each reach to be treated.